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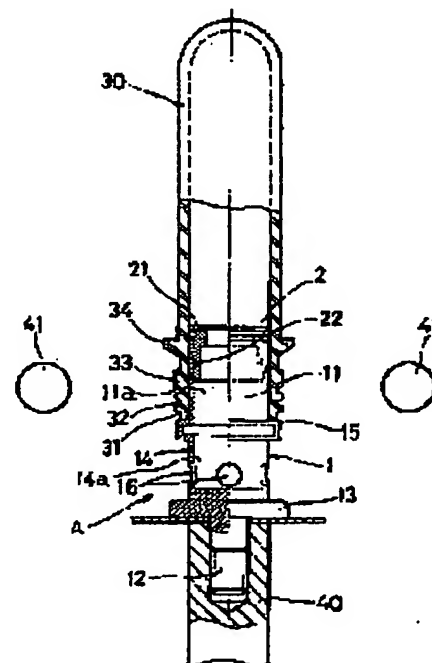
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(54) CORE FOR CONTROLLING INSIDE DIAMETER OF MOUTH NECK PORTION OF PREFORM

(57)Abstract:

PROBLEM TO BE SOLVED: To improve heating and cooling followability, to suppress the conduction of heat to a portion other than a mouth neck portion to prevent the crystallization up to an unnecessary portion and to certainly and efficiently crystallize only the mouth neck portion in an inside diameter controlling core used at the time of crystallization of the mouth neck portion of a preform.

SOLUTION: An inside diameter controlling core A is formed of a core main body 1 having a cylindrical core portion 11 to which the mouth neck portion 31 of a preform 30 is externally fitted and the annular heat blocking core member 2 attached to the leading end of the cylindrical core portion 11. In this case, the conduction of that to a portion other than the mouth neck portion 31 of the preform 30 is suppressed by the heat blocking core member 2.



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CLAIMS

[Claim(s)]

[Claim 1] The core body which has the tubed core section into which it is the core for inside diameter calibration of the preforming opening neck with which the equipment which heat-treats the opening neck of preforming for bottles made of polyester resin, and is crystallized is equipped, and the opening neck of preforming fits, The core for inside diameter calibration of the preforming opening neck characterized by consisting of an annular core member for thermal insulation attached at the tip of said tubed core section, and controlling heat conduction to parts other than the opening neck of preforming by said core member for thermal insulation.

[Claim 2] The core for inside diameter calibration of the preforming opening neck according to claim 1 which said core member for thermal insulation becomes from the mold goods of heat resistant resin, such as a fluororesin.

[Claim 3] The core for inside diameter calibration of the preforming opening neck according to claim 1 or 2 which comes to give coloring of the good color of heat absorption nature to the front face of said tubed core section at least of said core body.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the core for inside diameter calibration of the preforming opening neck used with the equipment which heat-treats the opening neck of preforming of the bottle made of polyester resin used for mainly holding various liquids, and is crystallized.

[0002]

[Description of the Prior Art] Conventionally, the bottle made of polyester resin, such as polyethylene terephthalate resin (the so-called PET), is widely used as a container with the outstanding properties, such as a mechanical strength, gas barrier property, and transparency.

[0003] Although this bottle made of polyester resin (henceforth a PET bottle) carries out biaxial extension processing of this and is usually obtained after it fabricates preforming (parison) as intermediate field, heat-treating this opening neck in order to strengthen the opening neck of this PURIOMU, making it crystallize, and making it milk is performed.

[0004] Various proposals are made as equipment which crystallizes this preforming opening neck. For example, it conveys giving rotation suitably to erection or a handstand condition with a conveyance means in support of preforming, and heat-treats during this conveyance, preforming which processing finished is cooled and collected, and the equipment which carries out consecutive processing is known as newly supplying preforming. And in such equipment, the core for inside diameter calibration is inserted in a preforming opening neck, and heat-treating, where the inner skin of an opening neck is supported with a core is also proposed in order to prevent a dimensional change, deformation, etc. accompanying the increment in a consistency, and contraction by heat-treatment of an opening neck (for example, JP,61-24170,B).

[0005] By the way, a core is inserted in a preforming opening neck as mentioned above, although said core consists of a metal body of a solid in case it heat-treats at an infrared heater etc. and is made to crystallize from the method of outside, since mass of a case is large, it is inferior to the imitation nature of heating and cooling, therefore when delay and heating time have short heating inside an opening neck, there is a possibility that it may not fully crystallize to the inside. Cooling of the core after crystallization processing also becomes slow, and the processing time becomes this thing for a long time again also in the above crystallization equipment which carries out consecutive processing.

[0006] Therefore, although it is thinking of enabling it to heat-treat efficiently the preforming opening neck which makes tubed the core for the aforementioned inside diameter calibration, improves the imitation nature of heating and cooling, and fits into this If said core is made tubed, heat will tend to get across to a way among preforming at the time of heating, it will be heated to parts other than the opening neck into which said core has not fitted, the boundary of the opening neck crystallized and milked and the other amorphous-ized part is in disorder, and problems, such as becoming unseemly, arise.

[0007] This invention tends to offer the core for inside diameter calibration which the imitation nature of heating and cooling can be good, can moreover control heat conduction to parts other than an opening neck, cannot crystallize to an unnecessary part in view of the above as a core for inside diameter

calibration of the preforming opening neck used for above crystallization equipment, and can crystallize only an opening neck certainly and efficiently.

[0008]

[Means for Solving the Problem] This invention is the core of the preforming opening neck with which the equipment which heat-treats the opening neck of preforming for bottles made of polyester resin, and is crystallized is equipped for inside diameter calibration, consists of a core body which has the tubed core section into which the opening neck of preforming fits, and an annular core member for thermal insulation attached at the tip of said tubed core section, and is characterized by to control heat conduction to parts other than the opening neck of preforming by said core member for thermal insulation.

[0009] In hollow, since mass is small, the deformation and the dimensional change accompanying crystallization by heat-treatment of the preforming opening neck into which the tubed core section of a core body fits it being the core for inside diameter calibration of this invention being controllable, and the tubed core section which fits into the opening neck of a core body especially is good, and the imitation nature of heating and cooling can carry out heating and cooling processing of it so efficiently. And since the core member for thermal insulation is attached at the tip of said tubed core section, the opening neck which could regulate heat conduction to parts other than the regio oralis, was crystallized efficiently certainly, could be made to milk only an opening neck, and was milked, and the boundary of the other part will appear clearly, and can process with sufficient appearance.

[0010] Said core member for thermal insulation consists of mold goods of heat resistant resin, such as a fluororesin, and thereby, invention of claim 2 has the good dimensional stability of this core member, and makes a heat insulation operation good. When consisting especially of a fluororesin, mold release of preforming after crystallization processing also becomes easy.

[0011] Moreover, invention of claim 3 is a thing of said core body which comes to give coloring of the good color of heat absorption nature to the front face of said tubed core section at least. Thereby, when heat-treating at an infrared heater or a near infrared ray heater, the infrared radiation of a heater is efficiently absorbable, since the tubed core section is hollow, heating can also heat an early, therefore preforming opening neck also from the inside, and poor heat-treatment and the lack of crystallization are not produced.

[0012]

[Embodiment of the Invention] Next, it explains based on the example which shows the gestalt of operation of this invention to a drawing.

[0013] The sectional views and drawing 3 from which drawing 1 separated the core body of the same as the above [drawing 2 / the half-section vertical section front view of the core for inside diameter calibration of one example of this invention and] and the core member for thermal insulation are some sectional views showing the heating processing state of the preforming opening neck using a core same as the above. Drawing 4 is the half-section vertical section front view showing other examples.

[0014] As shown in drawing 3 , as for preforming (30) of the PET bottle of a processing object, the support ring (34) for the thread part (32) for screwing a cap and a cap edge to hold the ring-like step (33) and bottle which are engaged is prepared in the periphery of an opening neck (31).

[0015] The core for inside diameter calibration of the example to illustrate (A) shows the case where the aforementioned preforming (30) is supported in the handstand condition, and consists of a core body (1), a core body (1) which has the tubed core section (11) of the cross-section cylindrical shape which can fit into the opening neck (31) of said preforming (30), and a core member for thermal insulation (2) attached at the tip of said tubed core section (11).

[0016] Said core body (1) consists of rigid material, such as metal material, such as aluminum, or ceramic material. Have a screw-thread shank (12) for fixing to the lower limit section to the attaching part (40) supported by rotation and the conveyance means (illustration abbreviation), and a flange (13) and the central cylinder part for a free passage (14) are minded on it. Said tubed core sections (11) which fit in to the opening neck (31) of preforming are formed successively.

[0017] Moreover, the flange-like step (15) is prepared between said tubed core sections (11) and central

cylinder parts (14). The inner hole (11a) of said tubed core section (11) and the inner hole (14a) of a central cylinder part (14) are open for free passage, and the air hole (16) which is well-informed about the necessary part (for example, four way type) of a hoop direction in the inner hole (11a) (14a) of the tubed core section (11) and a central cylinder part (14) is prepared in the central cylinder part (14).

[0018] The die length is set up so that the tip may attain said tubed core section (11) to the method location of inside corresponding to the die length of the opening neck (31) of preforming which fits into this more slightly than the boundary of an opening neck (31) and the other part, for example, the inside location of a support ring (34), and it. Moreover, in order that this tubed core section (11) may usually make easy the insertion and pulling out to an opening neck (31), the taper is attached very slightly.

[0019] Moreover, said core member for thermal insulation (2) is fabricated with heat resistant resin with the adiabatic efficiency of the fluoro-resin generally known as Teflon (trademark), makes annular, and as shown in drawing, it consists of the tip of the tubed core section (11), a heavy-gage part (21) of approximately the same diameter, and the attachment section (22) that is prolonged in shaft orientations and attached in the point inner circumference of said tubed core section (11) from this heavy-gage part (21). The stop section (23) of the cross-section hook configuration which fits in flexibly and is engaged to the circumferential groove (17) which it has in the point inner circumference of the tubed core section (11) is formed in the periphery of the attachment section (22), and it can attach firmly certainly with sufficient stability, without breaking away easily, if this stop section (23) is attached in an end and the tubed core section (11). Of course, it can also attach with other fixed means, such as an adhesion means.

[0020] In case this core member (2) fits the opening neck (31) of preforming (30) into said tubed core section (11) and supports this for example, in the handstand condition, when said core member (2) contacts the part of the inner direction a little from said opening neck (31), it can control heat conduction to parts other than an opening neck.

[0021] The circumferential groove for heat insulation (24) is prepared in the periphery of the heavy-gage part (21) of said core member (2), and it is prepared in it so that this may make certainly the thermal insulation operation by this core member (2). (25) is the micropore for aeration prepared in the necessary part of said circumferential groove (23), and can miss now the air of said between circumferential groove (23) at the time of fitting.

[0022] The width of face of the heavy-gage part (21) of said core member (2) is set up in consideration of the depressor effect of heat conduction at the time of heat-treatment in the condition of having fitted into the opening neck (31), and especially this better ** is usually set up before and after 4mm 2-6mm.

[0023] Since it is formed by the rigid material of metal material and others, such as aluminum, in order to improve the mold-release characteristic for pulling out of preforming after heat-treatment (30), as for the aforementioned core body (1), it is desirable to perform resin coating (illustration abbreviation) which improves the mold-release characteristic of a fluoro-resin and others.

[0024] Moreover, in the heat-treatment at the infrared heater and near infrared ray heater which are formed in the method of outside, in order to improve the heating effectiveness of a core body (1), it is desirable the peripheral face of the tubed core section (11) and to perform [of a core body (1)] coloring (illustration abbreviation) by coatings, such as the good color of the absorptivity of infrared radiation or a heat ray, for example, black, red, and gold, etc. to all front faces preferably at least. About 15-40 microns is suitable for the thickness of this coloring coating.

[0025] Being able to give rotation with rotation and a conveyance means, as shown in drawing 3, the core for inside diameter calibration (A) constituted as mentioned above passes through a heating zone from a supply zone, and fixes it to the attaching part (40) conveyed in cooling and a recovery zone by the bell and spigot of the screw-thread shank (12) of the lower limit section.

[0026] And the opening neck (31) of preforming (30) of a processing object is made into the lower part sense, and it fits into the tubed core section (11) by the side of the upper limit of the core body (1) in said core (A), and supports in the handstand condition. At this time, the air in preforming (30) is discharged through the inner hole (11a) of a core body (1), and (14a) an air hole (16). Conveyance migration of the heating zone is carried out in this condition, giving rotation with rotation and a conveyance means, and it heat-treats with heating means (41) allotted near this migration part during

this migration, such as an infrared heater and a near infrared ray heater. Thereby, the opening neck (31) of preforming (30) is gradually heated by 10,000 times, is milked with this heating and crystallized. Under the present circumstances, the deformation and the dimensional change accompanying crystallization are regulated by the tubed core section (11) of the core body (1) which fits into an opening neck.

[0027] The tubed core section (11) of said core body (1) which fits into said opening neck (31) especially is hollow. Since specific weight is small and the specific heat's is small, the imitation nature to heating is good and the tubed core section (11) itself is easy to be heated. So, also in the inside of the opening neck (31) which fits into this, a temperature rise becomes quick, it is quickly and fully heat-treated, and it crystallizes efficiently and the inside of an opening neck (31) is also milked.

[0028] Moreover, if good coloring of absorptivity, such as infrared radiation and a heat ray, is performed to the periphery front face of said tubed core section (11), even if the temperature rise of the tubed core section (11) becomes still quicker and it heats from the method of outside, it can heat-treat efficiently to the inside in a short time.

[0029] And since the core member for thermal insulation (2) is attached at the tip of the tubed core section (11) of said core body (1) and this core member (2) is located along the inside edge of an opening neck (31) in the case of heat-treatment of the above, it can control that the heat at the time of heating tends to heat-conduct to the inner direction by this core member (2). Therefore, to the boundary section of an opening neck (31) and the other part, it can crystallize certainly, and it can crystallize with finely and sufficient appearance and a boundary line with the part which is not crystallized can also be milked.

[0030] And in cooling and the recovery zone of consecutiveness of a heating zone, it is sampled and crystallized preforming (30) which was heat-treated as mentioned above is collected from said core (A), after being cooled.

[0031] A core body (1) is hollow in the case of the aforementioned cooling, since it is cooled comparatively early, cooling of an opening neck (31) cannot be checked, it can cool efficiently, and said core (A) can do comparatively the sampling activity of preforming (30) from the core after cooling in a short time satisfactory. Moreover, if good resin coating of the mold-release characteristic of a fluororesin etc. is performed to the core front face, an opening neck (31) cannot stick to a core (A), and it can sample still more easily.

[0032] In addition, although the case where the tubed core section (11) into which a preforming opening neck fits was a core body (1) and really formed was shown, like drawing 4, the sleeve (11c) (11d) of 1 or plurality (in the case of drawing two) can be fitted in the periphery of the container liner (11b) of a core body (1) and one, and it can also constitute from an above-mentioned example in dual structure. (18) of drawing is the concave of a hoop direction, and (19) is an air hole.

[0033]

[Effect of the Invention] As described above, according to the core for inside diameter calibration of the preforming opening neck of this invention The imitation nature of about [that the deformation and the dimensional change accompanying crystallization are certainly controllable], heating, and cooling is good. And heat conduction to parts other than an opening neck can be controlled effectively, it cannot crystallize to an unnecessary part, only an opening neck can be crystallized certainly and efficiently, and it can greatly contribute to the improvement in efficiency of crystallization processing of a preforming opening neck.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is half-section drawing of longitudinal section showing one example of the core for inside diameter calibration of this invention.

[Drawing 2] It is the sectional view which separated the core body same as the above and the core member for thermal insulation.

[Drawing 3] They are some sectional views showing the heating processing state of the preforming opening neck using a core same as the above.

[Drawing 4] It is the half-section vertical section front view showing other examples of the core for inside diameter calibration of this invention.

[Description of Notations]

(A) The core for inside diameter calibration

(1) Core body

(11) Tubed core section

(12) Screw-thread shank

(13) Flange

(14) Central cylinder part

(15) Flange-like step

(16) Air hole

(17) Circumferential groove

(2) The core member for thermal insulation

(21) Heavy-gage part

(22) Attachment section

(23) Stop section

(24) Circumferential groove

(30) Preforming

(31) Opening neck

(32) Thread part

(34) Support ring

(40) Attaching part

(41) Heating means

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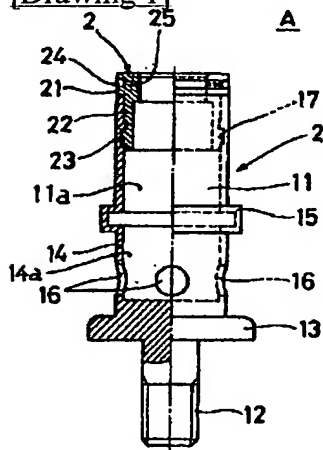
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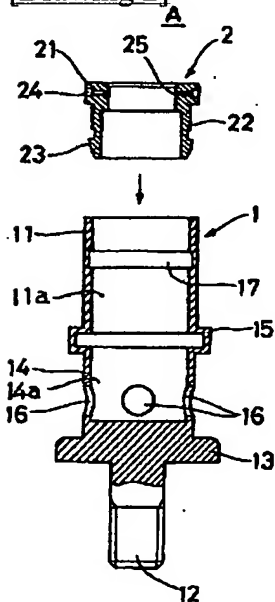
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DRAWINGS

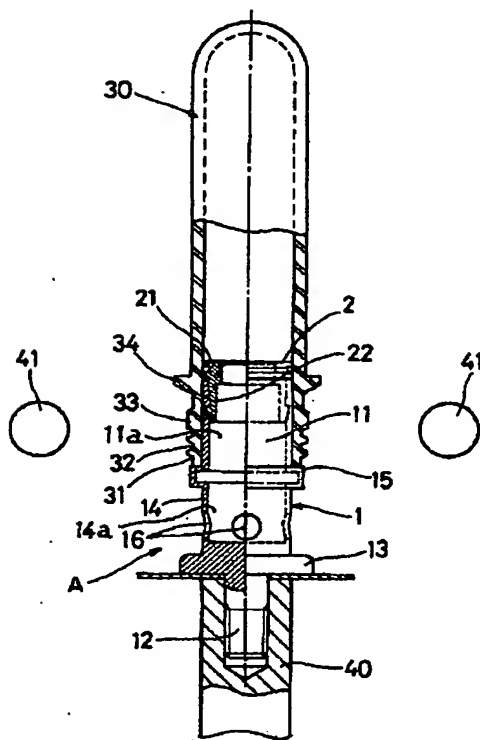
[Drawing 1]



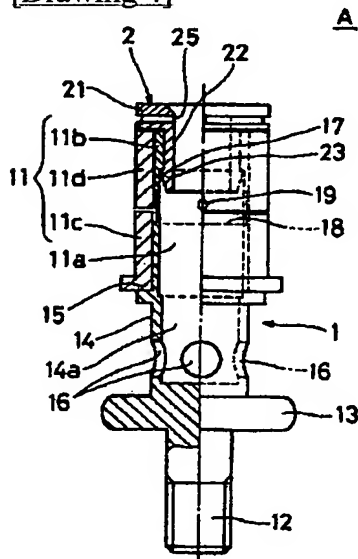
[Drawing 2]



[Drawing 3]



[Drawing 4]



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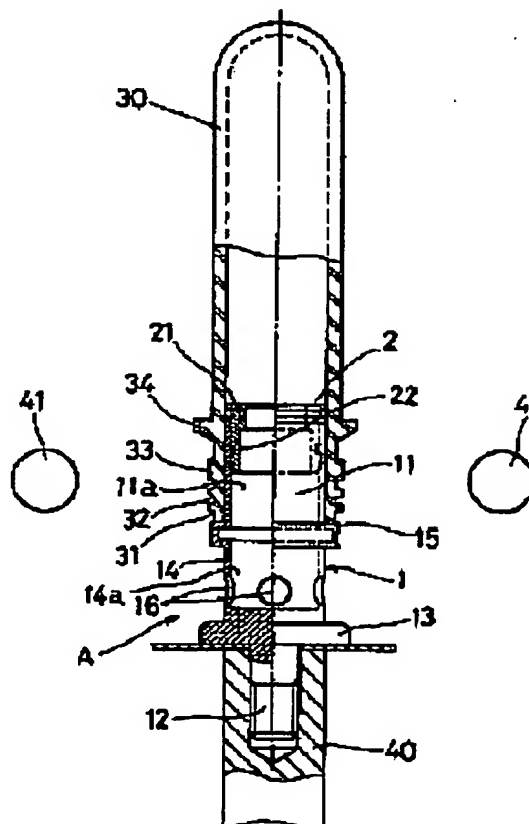
CORE FOR CONTROLLING INSIDE DIAMETER OF MOUTH NECK PORTION OF PREFORM

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Applicant: OSAKA REIKEN KK
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Abstract of JP2000190383

PROBLEM TO BE SOLVED: To improve heating and cooling followability, to suppress the conduction of heat to a portion other than a mouth neck portion to prevent the crystallization up to an unnecessary portion and to certainly and efficiently crystallize only the mouth neck portion in an inside diameter controlling core used at the time of crystallization of the mouth neck portion of a preform. **SOLUTION:** An inside diameter controlling core A is formed of a core main body 1 having a cylindrical core portion 11 to which the mouth neck portion 31 of a preform 30 is externally fitted and the annular heat blocking core member 2 attached to the leading end of the cylindrical core portion 11. In this case, the conduction of that to a portion other than the mouth neck portion 31 of the preform 30 is suppressed by the heat blocking core member 2.



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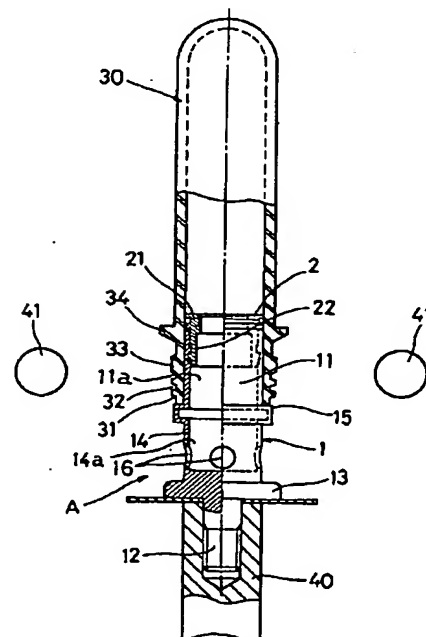
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(54) 【発明の名称】 プリフォーム口首部の内径規制用コア

(57) 【要約】

【課題】 プリフォームの口首部を結晶化する際に使用する内径規制用コアとして、加熱、冷却の追従性が良く、口首部以外の部分への熱伝導を抑制でき、不必要な部分まで結晶化することがなく、口首部のみを確実にかつ効率よく結晶化できるようにする。

【解決手段】 内径規制用コアAを、プリフォーム30の口首部31が嵌合する筒状コア部11を有するコア本体1と、前記筒状コア部11の先端に取着された環状の遮熱用コア部材2とにより形成し、遮熱用コア部材2によりプリフォーム30の口首部31以外の部分への熱伝導を抑制する。



【特許請求の範囲】

【請求項1】 ポリエステル樹脂製のボトル用プリフォームの口首部を加熱処理して結晶化させる装置に備えるプリフォーム口首部の内径規制用コアであって、プリフォームの口首部が嵌合する筒状コア部を有するコア本体と、前記筒状コア部の先端に取着された環状の遮熱用コア部材とからなり、前記遮熱用コア部材によりプリフォームの口首部以外の部分への熱伝導を抑制するようにしたことを特徴とするプリフォーム口首部の内径規制用コア。

【請求項2】 前記遮熱用コア部材が、フッ素樹脂等の耐熱性樹脂の成形品よりなる請求項1に記載のプリフォーム口首部の内径規制用コア。

【請求項3】 前記コア本体の少なくとも前記筒状コア部の表面に、熱吸収性のよい色の着色が施されてなる請求項1または2に記載のプリフォーム口首部の内径規制用コア。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、主として各種液体を収容するのに用いられるポリエステル樹脂製ボトルのプリフォームの口首部を加熱処理して結晶化させる装置で使用するプリフォーム口首部の内径規制用コアに関するものである。

【0002】

【従来の技術】 従来より、ポリエチレンテレフタレート樹脂（いわゆるPET）等のポリエステル樹脂製のボトルは、機械的強度、ガスバリア性、透明性等の優れた特性を持つ容器として広く利用されている。

【0003】 かかるポリエステル樹脂製ボトル（以下、PETボトルという）は、通常、中間体としてのプリフォーム（パリソン）を成形した後、これを2軸延伸加工して得られるが、このプリフォームの口首部を強化する目的で該口首部を加熱処理して結晶化させ白化させることが行われている。

【0004】 このプリフォーム口首部を結晶化させる装置としては、種々の提案がなされている。例えば、プリフォームを直立もしくは倒立状態に支持して、適宜搬送手段により回転を与えながら搬送し、この搬送中に加熱処理を行ない、処理の終わったプリフォームを冷却、回収して、新たにプリフォームを供給することとして、連続処理する装置が知られている。そして、このような装置において、口首部の加熱処理による密度の増加、収縮に伴う寸法変化や変形等を防止する目的で、プリフォーム口首部に内径規制用のコアを挿入し、口首部の内周面をコアで支持した状態で加熱処理することも提案されている（例えば、特公昭61-24170号公報）。

【0005】 ところで、前記のようにプリフォーム口首部にコアを挿入して、外方より赤外線ヒータ等により加熱処理して結晶化させる際、前記コアが中実の金属体よ

りなるもの場合は、質量が大きいために、加熱、冷却の追従性に劣り、そのため口首部の内側の加熱が遅れ、加熱時間が短いと、内側まで十分に結晶化されないおそれがある。また結晶化処理後のコアの冷却も遅くなり、前記の連続処理する結晶化装置においても、処理時間が長くなることになる。

【0006】 そのため、前記の内径規制用のコアを筒状にして、加熱、冷却の追従性をよくし、これに嵌合するプリフォーム口首部の加熱処理を効率よく行なえるようにすることが考えられているが、前記コアを筒状にすると、加熱時にプリフォームの内方に熱が伝わり易く、前記コアが嵌合していない口首部以外の部分まで加熱されてしまい、結晶化し白化した口首部とそれ以外の非結晶化部分との境界が乱れて不体裁になる等の問題が生じる。

【0007】 本発明は、上記に鑑みて、前記の結晶化装置に使用するプリフォーム口首部の内径規制用コアとして、加熱、冷却の追従性が良く、しかも口首部以外の部分への熱伝導を抑制でき、不必要な部分まで結晶化することがなく、口首部のみを確実にかつ効率よく結晶化することができる内径規制用コアを提供しようとするものである。

【0008】

【課題を解決するための手段】 本発明は、ポリエステル樹脂製のボトル用プリフォームの口首部を加熱処理して結晶化させる装置に備えるプリフォーム口首部の内径規制用コアであって、プリフォームの口首部が嵌合する筒状コア部を有するコア本体と、前記筒状コア部の先端に取着された環状の遮熱用コア部材とからなり、前記遮熱用コア部材によりプリフォームの口首部以外の部分への熱伝導を抑制するようにしたことを特徴とする。

【0009】 この発明の内径規制用コアであると、コア本体の筒状コア部が嵌合するプリフォーム口首部の加熱処理による結晶化に伴う変形や寸法変化を規制できるばかりか、特にコア本体の口首部に嵌合する筒状コア部が中空で質量が小さいために、加熱および冷却の追従性がよく、それだけ効率よく加熱および冷却処理できる。しかも前記筒状コア部の先端には、遮熱用コア部材が取着されているために、口部以外の部分への熱伝導を規制でき、口首部のみを確実に効率よく結晶化され白化させることができ、白化した口首部と、それ以外の部分の境界が明瞭に現われ、体裁よく処理できることになる。

【0010】 請求項2の発明は、前記遮熱用コア部材が、フッ素樹脂等の耐熱性樹脂の成形品よりなるものであり、これにより、該コア部材の寸法安定性がよく、断熱作用を良好になす。特にフッ素樹脂よりなる場合、結晶化処理後のプリフォームの離型も容易になる。

【0011】 また、請求項3の発明は、前記コア本体の少なくとも前記筒状コア部の表面に熱吸収性のよい色の着色が施されてなるものである。これにより、赤外線ヒ

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ータや近赤外線ヒータにより加熱処理する場合、ヒータの赤外線を効率よく吸収できて、筒状コア部が中空であることもあって、加熱も早く、したがってプリフォーム口首部を内側からも加熱できることになり、加熱処理不良、結晶化不足を生じることがない。

【0012】

【発明の実施の形態】次に本発明の実施の形態を図面に示す実施例に基いて説明する。

【0013】図1は、本発明の1実施例の内径規制用コアの半部縦断正面図、図2は同上のコア本体と遮熱用コア部材を分離した断面図、図3は同上のコアを用いたプリフォーム口首部の加熱処理状態を示す一部の断面図である。図4は他の実施例を示す半部縦断正面図である。

【0014】処理対象のPETボトルのプリフォーム(30)は、図3に示すように、口首部(31)の外周には、キャップを螺合するためのねじ部(32)、キャップ端部に係合するリング状段部(33)およびボトルを保持するためのサポートリング(34)が設けられている。

【0015】図示する実施例の内径規制用コア(A)は、前記のプリフォーム(30)を倒立状態に支持する場合を示し、コア本体(1)と前記プリフォーム(30)の口首部(31)に嵌合できる断面円筒形の筒状コア部(11)を有するコア本体(1)と、前記筒状コア部(11)の先端に装着される遮熱用コア部材(2)とから構成されている。

【0016】前記コア本体(1)は、アルミニウム等の金属材料あるいはセラミック材等の剛性材よりなり、その下端部には回転および搬送手段(図示省略)に支持された保持部(40)に対し固定するためのねじ軸部(12)を有し、その上に、フランジ部(13)および連通用の中央筒部(14)を介して、プリフォームの口首部(31)に対して嵌合する前記筒状コア部(11)が連結されている。

【0017】また前記筒状コア部(11)と中央筒部(14)の間にはフランジ状の段部(15)が設けられている。前記筒状コア部(11)の内孔(11a)と中央筒部(14)の内孔(14a)は連通しており、中央筒部(14)には周方向の所要の箇所(例えば四方)に筒状コア部(11)および中央筒部(14)の内孔(11a)(14a)に通じる通気孔(16)が設けられている。

【0018】前記筒状コア部(11)は、これに嵌合するプリフォームの口首部(31)の長さに対応して、その先端が口首部(31)とそれ以外の部分との境界、例えばサポートリング(34)の内側位置もしくはそれより僅かに内方位置まで達するように、その長さが設定されている。またこの筒状コア部(11)は、通常、口首部(31)に対する挿入および抜脱を容易にするために、ごく僅かにテーパが付けられている。

【0019】また前記遮熱用コア部材(2)は、一般に

テフロン(登録商標)として知られるフッ素樹脂等の断熱効果のある耐熱性樹脂により成形されて環状をなすもので、図のように、筒状コア部(11)の先端と略同径の厚肉部(21)と、該厚肉部(21)より軸方向に延びて前記筒状コア部(11)の先端部内周に嵌着される嵌着部(22)とからなる。嵌着部(22)の外周には、筒状コア部(11)の先端部内周に有する周溝(17)に対し弾力的に嵌合し係合する断面鉤形状の係止部(23)が形成されており、この係止部(23)により、一端、筒状コア部(11)に嵌着されると、容易に離脱することなく、安定性よく確実に強固に装着できるようになっている。もちろん接着手段等の他の固定手段により装着することもできる。

【0020】このコア部材(2)は、前記筒状コア部(11)にプリフォーム(30)の口首部(31)を嵌合して、これを例えば倒立状態に支持する際、前記コア部材(2)が前記口首部(31)よりやや内方の部分に当接することにより、口首部以外の部分への熱伝導を抑制できるようになっている。

【0021】前記コア部材(2)の厚肉部(21)の外周には、断熱用の周溝(24)が設けられており、これにより該コア部材(2)による遮熱作用を確実になすように設けられている。(25)は前記周溝(23)の所要の箇所に設けた通気用の微小孔で、嵌合時に前記周溝(23)の空気を逃せるようになっている。

【0022】前記コア部材(2)の厚肉部(21)の幅は、口首部(31)に嵌合した状態での加熱処理時の熱伝導の抑制効果を考慮して設定するもので、通常2~6mm、特にこのましくは4mm前後に設定される。

【0023】前記のコア本体(1)は、アルミニウム等の金属材料その他の剛性材で形成されるので、加熱処理後のプリフォーム(30)の抜脱のための離型性をよくするために、フッ素樹脂その他の離型性を良くする樹脂コーティング(図示省略)を施しておくのが好ましい。

【0024】また、外方に設けられる赤外線ヒータや近赤外線ヒータによる加熱処理において、コア本体(1)の加熱効果をよくするために、コア本体(1)の少なくとも筒状コア部(11)の外周面、好ましくは全表面に、赤外線や熱線の吸収性のよい色、例えば黒、赤、金色等のコーティング等による着色(図示省略)を施しておくのが望ましい。この着色コーティングの厚みは15~40ミクロン程度が好適である。

【0025】上記のように構成される内径規制用コア(A)は、図3に示すように、回転および搬送手段により回転を与えられながら、供給ゾーンから加熱ゾーンを通過し、冷却および回収ゾーンへ搬送される保持部(40)に対し、下端部のねじ軸部(12)のねじ込みにより固定しておく。

【0026】そして、処理対象のプリフォーム(30)の口首部(31)を下方向きにして、前記コア(A)に

おけるコア本体(1)の上端側の筒状コア部(11)に嵌合し倒立状態に支持する。このとき、プリフォーム(30)内の空気は、コア本体(1)の内孔(11a)、(14a)および通気孔(16)を通じて排出される。この状態で、回転および搬送手段により回転を与えながら加熱ゾーンを搬送移動させて、この移動中に、該移動部分の近傍に配された赤外線ヒータや近赤外線ヒータ等の加熱手段(41)により加熱処理する。これにより、プリフォーム(30)の口首部(31)は、徐々にかつ万遍に加熱されて、この加熱により白化し結晶化する。この際、口首部に嵌合するコア本体(1)の筒状コア部(11)により結晶化に伴う変形や寸法変化が規制される。

【0027】特に、前記口首部(31)に嵌合する前記コア本体(1)の筒状コア部(11)が中空であって、比重量が小さく比熱も小さいために加熱に対する追随性がよくて、筒状コア部(11)自体も熱せられ易く、それゆえこれに嵌合する口首部(31)の内側においても温度上昇が速くなり、口首部(31)の内側も迅速にかつ十分に加熱処理されて効率よく結晶化し白化する。

【0028】また、前記筒状コア部(11)の外周表面に赤外線や熱線等の吸収性のよい着色が施されていると、筒状コア部(11)の温度上昇がさらに速くなり、外方から加熱するものであっても、内側まで効率よく短時間に加熱処理できることになる。

【0029】しかも、前記の加熱処理の際、前記コア本体(1)の筒状コア部(11)の先端には、遮熱用コア部材(2)が取着されており、該コア部材(2)が口首部(31)の内側端に沿って位置しているので、加熱時の熱が内方へ熱伝導しようとするのをこのコア部材(2)によって抑制できる。したがって口首部(31)とそれ以外の部分との境界部まで確実に結晶化でき、結晶化されてない部分との境界線も綺麗で体裁よく結晶化でき白化できることになる。

【0030】そして、前記のように加熱処理された結晶化されたプリフォーム(30)は、加熱ゾーンの後続の冷却および回収ゾーンにおいて、冷却されてから前記コア(A)から抜き取られ、回収される。

【0031】前記の冷却の際、前記コア(A)は、コア本体(1)が中空であって、比較的早く冷却されるので、口首部(31)の冷却を阻害することがなく、効率よく冷却でき、冷却後のコアからのプリフォーム(30)の抜き取り作業を比較的短時間に問題なく行なうことができる。またコア表面にフッ素樹脂等の離型性のよい樹脂コーティングが施されていると、口首部(31)がコア(A)に密着することがなく、さらに容易に抜き取ることができる。

【0032】なお、上記した実施例では、プリフォーム口首部が嵌合する筒状コア部(11)をコア本体(1)と一体形成した場合を示したが、このほか、例えば図4のように、コア本体(1)と一体の内筒(11b)の外周に1もしくは複数(図の場合二つ)のスリーブ(11c)(11d)を嵌装して二重構造に構成することもできる。図の(18)は周方向の凹溝、(19)は通気孔である。

【0033】

10 【発明の効果】上記したように、本発明のプリフォーム口首部の内径規制用コアによれば、結晶化に伴う変形や寸法変化を確実に規制できるばかりか、加熱、冷却の追随性が良く、しかも口首部以外の部分への熱伝導を効果的に抑制でき、不必要な部分まで結晶化することがなく、口首部のみを確実にかつ効率よく結晶化することができ、プリフォーム口首部の結晶化処理の能率向上に大いに貢献できる。

【図面の簡単な説明】

20 【図1】本発明の内径規制用コアの1実施例を示す半部縦断面図である。

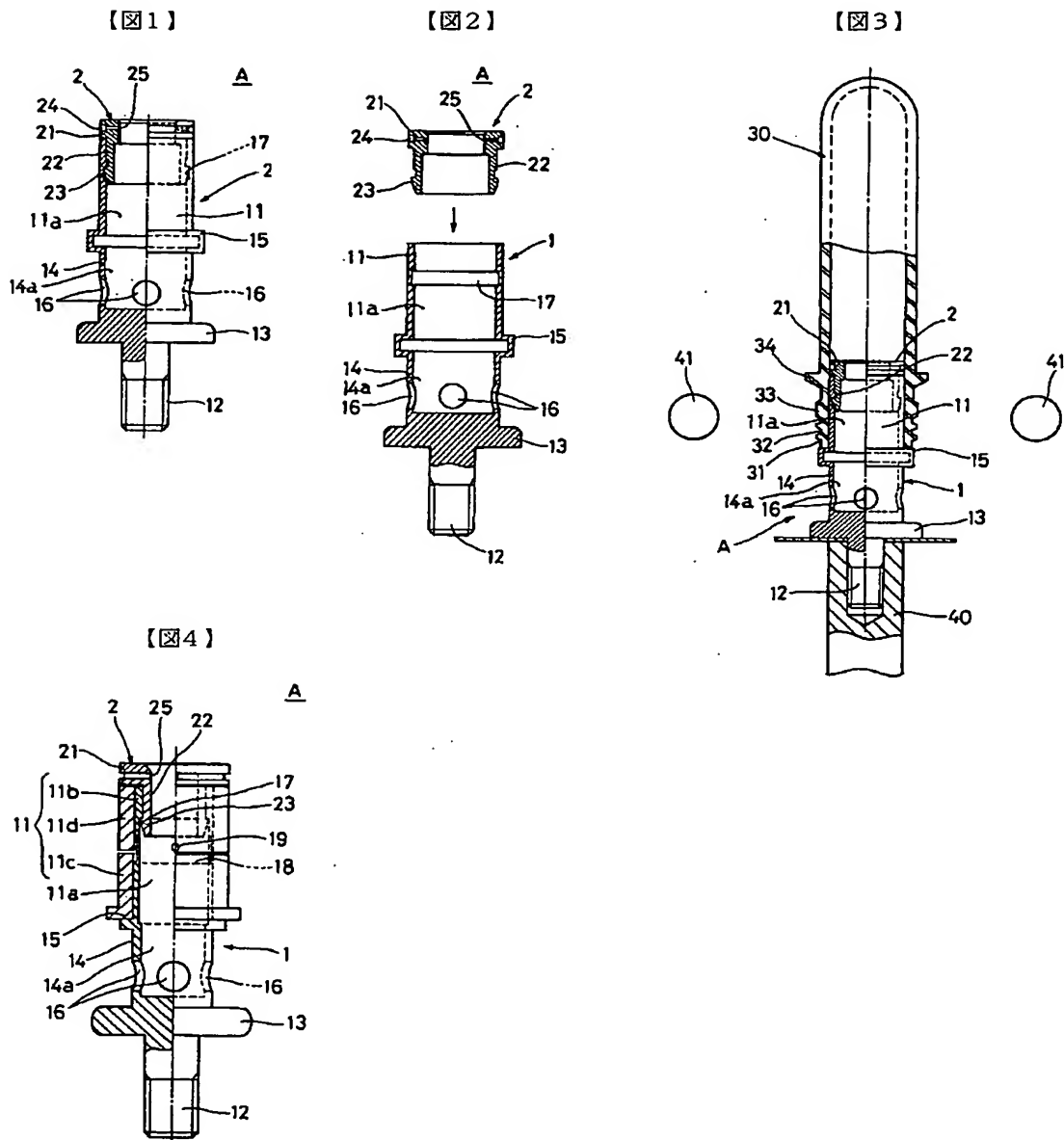
【図2】同上のコア本体と遮熱用コア部材を分離した断面図である。

【図3】同上のコアを用いたプリフォーム口首部の加熱処理状態を示す一部の断面図である。

【図4】本発明の内径規制用コアの他の実施例を示す半部縦断面図である。

【符号の説明】

(A) 内径規制用コア
(1) コア本体
(11) 筒状コア部
(12) ねじ軸部
(13) フランジ部
(14) 中央筒部
(15) フランジ状の段部
(16) 通気孔
(17) 周溝
(2) 遮熱用コア部材
(21) 厚肉部
(22) 嵌着部
(23) 係止部
(24) 周溝
(30) プリフォーム
(31) 口首部
(32) ねじ部
(34) サポートリング
(40) 保持部
(41) 加熱手段



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